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GUY P. JONES
Editor

THE PATHOGENESIS OF SYPHILITIC COMPLICATIONS

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Some years ago Bruusgard showed that a considerable proportion of untreated syphilitics passed through life without developing any harmful complications. In fact, almost two-thirds of the patients whom he studied had lived in comparative harmony with the *Spirocheta pallida*. This ability of the spirochete and the human host to live together in complete symbiosis is a common characteristic of the disease not widely appreciated, and considered by most as a rare end result of the untreated disease. It is conceivable that this type of harmless parasitism is the rule rather than the exception and that the development of complications, such as general paresis, tabes dorsalis, and cardio-vascular syphilis, is a fortuitous event representing the disruption of an essentially harmless relationship.

The historical background for the current attitude that syphilis is a disease whose death dealing destruction is comparable to cancer, leprosy, etc., is easy to trace. The violent epidemic of syphilis which spread throughout Europe in the early sixteenth century, attended by a high mortality even during the early stages of the disease, remains within recent historical perspective and still colors contemporary thought.

The subsequent change in the nature of the disease with a decline in its severity was obscured by the absence of modern diagnostic procedures. Prior to 1906 the diagnosis of syphilis rested chiefly upon a clinical basis. It is for this reason that the great syphilologists of the nineteenth century were able to amass and describe the vast groups of syphilitic destructive lesions which seemed so characteristic of

the disease. The larger group of "healthy" syphilitics never came to medical attention and were rarely diagnosed.

It was only through the fortunate decision of Boeck, the Chief of the Oslo Clinic from 1891 to 1905, not to treat syphilitics with the inadequate drugs then available that a truer insight into the nature of the disease was attained. Bruusgard subsequently was able to investigate a considerable proportion of these patients and throw light on the spontaneous evolution of the disease.

A further potent cause for the distorted conception of syphilis held by so many lay people and medical men alike is its association with sex. It is fair to assume that if syphilis were an air-borne communicable disease rather than a disease communicated by sexual contact, our present knowledge of it would be less confused.

A modern epidemiological approach to the problem of syphilis based on the best scientific study available would assume that the *Spirocheta pallida*, after its invasion of the human adult organism, proceeds to its perivascular habitat, there to live in comparative quiescence and harmony. Occasionally, however, this relationship may be broken with the development of serious damage to the tissues of the host. The chief problem of present day students of the disease is to discover the nature of the event which changes what is ordinarily harmless symbiosis to harmful parasitism.

Although very little scientifically studied factual material is at hand which throws light on this problem certain deductive speculations may be permitted. Since late complications of syphilis occur only in a

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relatively small proportion of patients, it can be postulated that a secondary, motivating force has altered the expected course of events. The nature of the activating agent then becomes a problem for the researcher to discover.

Several examples will illustrate how this hypothesis of dual causation may work. It is conceivable that the development of a mild vitamin deficiency in a person with syphilis might precipitate a syndrome which would not occur otherwise. *Tabes dorsalis* and syphilitic optic atrophy have already been considered by some as possibly due to a combination of syphilis and thiamine deficiency. According to this theory the combined effect of the spirochete upon the vascular system and the thiamine deficiency upon the nervous system produces the syndrome known as *tabes dorsalis* on the one hand, or syphilitic primary optic atrophy on the other. The development of general paresis may also be the result of a somewhat similar combination of events. In this connection the common finding of a history of chronic alcoholism in tabetics and paretics is worthy of note. Interstitial keratitis in congenital syphilis may be due, at least in some cases, to the concomitant development of riboflavin deficiency. It has been demonstrated that the latter may cause interstitial keratitis hardly distinguishable from the interstitial keratitis of congenital syphilis. It is quite possible that the two together may produce the inflammatory condition of the cornea more readily than either one alone. The gummatous degeneration of skin burns and traumata in previously "healthy" syphilitic individuals is a familiar example of dual causation. Cardiovascular involvement occurs in a relatively small percentage of patients. This very serious complication may be due to a combination of circumstances of which syphilitic infection is only one. The factor other than syphilis which leads to the breakdown of the elastic tissue in the aorta is not known, but perhaps a deficiency of one of the vitamins activates the actual tissue destruction. Another possibility is that cardiovascular syphilis has no relation to any vitamin deficiency but is associated with the unusual development of other degenerative processes, such as arteriosclerosis, hypertension, etc., characteristic of the degenerative period. It may also be possible that a genetic vascular deficiency is present in those patients who develop cardiovascular syphilis, and that a study of the familial and hereditary background would throw light upon the development of this complication. The proposition that cardiovascular syphilis is due solely to the spirochete does not adequately explain the fact that 80% to 90% of untreated syphilitics (whose aortas are probably invaded during the early stages of the infection)

never develop manifest aortic disease. The resistance of congenital syphilitics to cardiovascular involvement also throws doubt on the pathogenicity of the spirochete alone for the aorta.

The idea of dual causation has been applied to diseases other than syphilis. For example, it is well recognized that the course of tuberculosis is profoundly altered by many secondary factors. According to some observers leprosy is a disease which develops only in those who have a susceptible genetic constitution. Rheumatic fever has often been considered to be a condition due to multiple agents acting together. The application of the concept that syphilitic complications are due to a combination of syphilis plus secondary factors is not, therefore, out of accord with current thought in relation to other diseases.

The foregoing epidemiological approach to syphilis and its complications is merely speculative. It may, however, suggest a new method of approach both in the animal research laboratory and in clinical studies. —From the September Bulletin of Genitoinfectious Diseases, published by the Massachusetts Society for Mental Hygiene, Inc.

PSITTACOSIS CONTROL

During the month of August, 1941, shipments of 1600 shell parakeets to other States were authorized, also certificates for 221 larger psittacine birds were issued. There were 18 aviary inspections, four aviaries tested as a part of the survey not yet completed and eight aviaries tested for the first time. These tests have not been completed as yet.

CHANGES AMONG HEALTH OFFICERS

Dr. Robert H. Miles has been appointed City Health Officer of Alameda to succeed Dr. Leonard E. Skilling. The City of Corona has transferred the administration of its public health to the Riverside County Health Department. Dr. Denver D. Roos has been serving as City Health Officer of Corona.

Travel by automobile has greatly increased in this century. In 1895 there were only four automobiles manufactured in the United States but since that time there have been years when as many as 5,000,000 were manufactured. On December 31, 1939, there were registered in the United States 30,615,000 motor vehicles. The same year there were approximately 41,000,000 drivers of automobiles and the total number of miles traveled was about 270,000,000,000. There were in the United States in 1939, 32,500,000 families with a total population of 131,000,000.

RODENT SURVEY CONTINUED

The rodent survey conducted by the Bureau of Sanitary Inspections was continued during August in sections of Alameda, Contra Costa, San Francisco, Monterey, San Luis Obispo, Siskiyou, Kern, Los Angeles, San Bernardino and Solano counties, as well as Yerba Buena and Treasure Islands in San Francisco Bay. A total of 7,209 animals was collected and examined and nearly 58,000 fleas and 1,100 lice taken from these animals were sent to the laboratory for examination. Bubonic plague was demonstrated in one ground squirrel and in 12 pools of fleas taken from Kern and Siskiyou counties. In Siskiyou County particular attention was paid to the premises where a death from bubonic plague occurred August 9th. Conditions on the property create a harboring place as well as a food supply for numerous rodents which infested the premises and adjacent areas. The vicinity was heavily infested with ground squirrels, chipmunks, rabbits and mice. Particular attention was paid to the destruction of fleas. Beds, bedding, and wearing apparel were treated for their destruction. All rubbish about the premises was cleaned and burned. Assistance was given in the control of fleas in another section of Siskiyou County where a fatal case of plague occurred in June. The county agricultural commissioner with three crews totaling 14 men was engaged in rodent control work during August. All open squirrel burrows are being treated for the destruction of fleas and closed and grain poisoned with strychnine is frequently distributed. The rodent situation in zones surrounding military encampments was investigated. A five-year program has been outlined in one area and crews operating will be increased to about 100 men. In another military area in addition to State and county departments of agriculture, a crew of 30 men from a CCC camp is engaged in rodent control activities. Seven flying fields in three counties of the State as well as a seaport were given special attention.

PARASITOLOGICAL WORK CONTINUED

At a recent meeting of the California State Board of Public Health it was decided to continue in the Bacteriological Laboratory of the State Department of Public Health at Berkeley the examination of specimens for parasites which has heretofore been carried on by Dr. Charles A. Kofoed. Such examinations will be made for public health purposes only.

Following the line of least resistance is what makes men and rivers crooked.—Blemis Blotter.

REVISED LIST OF REPORTABLE DISEASES*Reportable Only:*

Anthrax
 Botulism—if commercial product notify State Department of Health at once.
 Coccidioidal Granuloma
 Dengue—keep patient in mosquito free room.
 Epilepsy
 Food Poisoning
 Glanders—report by phone or telegraph.
 Jaundice—infectious or epidemic types.
 Malaria—keep patient in mosquito free room.
 Pneumonia—specify type of pneumococcus, if known.
 Relapsing fever
 Rocky Mountain Spotted Fever
 Tetanus
 Trichinosis
 Tularemia
 Undulant fever

Reportable and Subject to Isolation:

Epidemic diarrhea of the newborn (in institutions)
 Chickenpox
 Dysentery—Amoebic
 Dysentery—Bacillary—specify type, if known.
 German Measles
 Influenza
 Measles
 Mumps
 Ophthalmia Neonatorum
 Psittacosis
 Rabies—in animals. Use special card.
 Rabies—in humans.
 Septic Sore Throat (in epidemic form).
 Trachoma
 Tuberculosis—use special card.
 Whooping Cough
 Syphilis—use special card.
 Gonorrhea—use special card.
 Chancroid—use special card.
 Lymphopathia Venereum—use special card.
 Granuloma inguinale—use special card.

Reportable and Subject to Quarantine and Placarding:

Cholera—report by telephone or telegraph to State Department of Health.
 Diphtheria
 Encephalitis (Infectious)—specify type, if known.

NOTE: This means all forms of acute encephalitis such as St. Louis type, equine type, and any other epidemic form occurring in California.

Leprosy
 Meningitis (due to the meningococcus).
 Paratyphoid Fever—specify type A or B.
 Plague—report by telephone or telegraph to State Department of Health.
 Acute Anterior Poliomyelitis

REVISED LIST OF REPORTABLE DISEASES—Continued

Scarlet Fever
 Smallpox
 Typhoid Fever
 Typhus Fever
 Yellow Fever—report by telephone or telegraph to
 State Department of Health.

MORBIDITY

Complete Reports for Following Diseases for Week Ending
September 27, 1941

Chickenpox

126 cases from the following counties: Alameda 20, Fresno 1, Humboldt 1, Kern 1, Los Angeles 26, Marin 2, Merced 1, Monterey 1, Orange 3, Plumas 2, Sacramento 3, San Benito 1, San Bernardino 1, San Diego 7, San Francisco 9, San Joaquin 15, San Luis Obispo 2, Santa Barbara 3, Santa Clara 10, Santa Cruz 1, Sonoma 12, Tulare 1, Ventura 1, Yolo 1, Yuba 1.

German Measles

46 cases from the following counties: Alameda 5, Fresno 2, Los Angeles 5, Monterey 6, Orange 1, San Diego 4, San Francisco 7, San Joaquin 3, San Luis Obispo 1, San Mateo 1, Santa Barbara 1, Shasta 1, Solano 4, Sonoma 3, Ventura 1, Yolo 1.

Measles

79 cases from the following counties: Alameda 3, Kern 4, Los Angeles 13, Monterey 5, Orange 3, Riverside 4, Sacramento 1, San Diego 8, San Francisco 2, San Joaquin 3, San Luis Obispo 2, Santa Clara 2, Sonoma 23, Stanislaus 2, Tulare 3, Ventura 1.

Mumps

287 cases from the following counties: Alameda 22, Contra Costa 2, Kern 6, Los Angeles 78, Madera 1, Monterey 1, Orange 23, Riverside 1, Sacramento 1, San Bernardino 22, San Diego 39, San Francisco 8, San Joaquin 18, San Luis Obispo 2, Santa Barbara 4, Santa Clara 13, Shasta 10, Solano 6, Sonoma 11, Tulare 4, Ventura 14, Yolo 1.

Scarlet Fever

64 cases from the following counties: Alameda 2, Contra Costa 1, Imperial 1, Kern 9, Los Angeles 28, Riverside 2, San Diego 7, San Francisco 4, San Joaquin 2, Santa Clara 1, Solano 6, Tuolumne 1.

Whooping Cough

238 cases from the following counties: Alameda 39, Fresno 6, Inyo 3, Kern 1, Los Angeles 64, Marin 1, Monterey 4, Orange 5, Plumas 4, Riverside 2, Sacramento 2, San Bernardino 1, San Diego 30, San Francisco 13, San Joaquin 16, San Luis Obispo 6, San Mateo 2, Santa Barbara 19, Santa Clara 2, Santa Cruz 1, Sonoma 9, Stanislaus 2, Tulare 2, Ventura 4.

Coccidioidal Granuloma

One case from Fresno County.

Diphtheria

18 cases from the following counties: Alameda 1, Fresno 4, Los Angeles 4, Madera 1, Riverside 1, Sacramento 3, San Benito 1, San Bernardino 2, Sutter 1.

Dysentery (Bacillary)

9 cases from the following counties: Fresno 1, Los Angeles 6, Monterey 2.

Encephalitis (Epidemic)

4 cases: Alameda County 1 (Oakland); Fresno County 3 (Sanger 1, Reedley 1, Fresno rural 1).

Food Poisoning

14 cases from Los Angeles County.

Malaria

3 cases from Sutter County.

Paratyphoid Fever

One case from Los Angeles County.

Poliomyelitis

10 cases: Kern County 2 (Bakersfield rural); Los Angeles County 4 (East Los Angeles Precinct 1, Long Beach 1, Los Angeles 2); Marin County 1 (Ross); Shasta County 1 (Central Valley); Stanislaus County 2 (Modesto rural 1, Modesto 1).

Rabies (Animal)

4 cases from Los Angeles County.

Tetanus

2 cases from the following counties: Alameda 1, Yolo 1.

Trichinosis

One case from San Francisco.

Tularemia

One case, California.*

Typhoid Fever

6 cases from the following counties: Alameda 1, Los Angeles 1, San Francisco 1, Stanislaus 2, California 1.*

Typhus Fever

2 cases: Los Angeles County 1, California 1.*

Undulant Fever

11 cases from the following counties: Butte 2, Fresno 1, Los Angeles 5, Modoc 1, San Mateo 1, Stanislaus 1.

* Cases charged to "California" represent patients ill before entering the State or those who contracted their illness traveling about the State throughout the incubation period of the disease. These cases are not chargeable to any one locality.

We believe it to be the duty of every citizen to do all within his power to improve the conditions under which men work and live. We believe that that man renders the greatest social service who so cooperates in the organization of industry as to afford to the largest number of men the greatest opportunity for self-development and the enjoyment by every man of those benefits which his own work adds to the wealth of civilization.—John D. Rockefeller, Jr.

"May I suggest, with respect to health education, that until we can establish some of our teaching on a more sound scientific foundation, we give a little less emphasis to personal hygiene habits—especially in our schools, teach the individual the importance of personal immunization, early medical care and diagnosis in illness, and impress upon him the value of community-wide environmental sanitation measures. We also need another kind of health education—what I call 'political' education—acquainting the public with what the health department can do, what its objectives are and what its achievements have been. This aspect of our health education program has been sadly neglected in many sections of the country in the past. There is urgent need for teaching these things—interpreting health needs and the health program to the 'man on the street,' and the woman in the home."—Dr. C. E. Waller, U.S.P.H.S.

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